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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,480	04/19/2001	Hiromichi Nakata	10517/94	7265

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EXAMINER
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DOVE, TRACY MAE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 08/20/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/837,480

Applicant(s)

NAKATA ET AL.

Examiner

Tracy Dove

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-14 and 16-46 is/are pending in the application.
- 4a) Of the above claim(s) 27-42 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-14,16-26 and 43-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This Office Action is in response to the communication filed on 7/15/03. Applicant's arguments have been considered, but are not persuasive. Claims 1, 2, 4-14 and 16-46 are pending. Claims 27-42 have been withdrawn as being directed to a non-elected invention. Claims 3 and 15 have been canceled. This Action is made **FINAL**, as necessitated by amendment.

#### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 4/16/03 has been considered by the examiner.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 4-14, 16-26 and 43-46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 13 have been amended to recite "the metal coating layer has a non-porous crystalline structure, resulting from melting and gradual cooling", which is not supported by the specification as filed. The specification does not support "a non-porous crystalline structure".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-13 and 16-26 are rejected under 35 U.S.C. 102(e)/35 U.S.C. 103(a) as being anticipated by, and alternatively unpatentable over, Yoshimura et al., US 6,291,094.

Yoshimura teaches a separator for a fuel cell and a fuel cell incorporating the separator. The gas separator of Yoshimura comprises a metal base member coated with an electrically conductive material other than carbon (first coating layer) and with a carbon material (second coating layer) so that a sufficiently high corrosion resistance can be achieved without using a costly material such as a noble metal. The separator has a carbon material coating on a contact face that contacts an adjacent member (for example, a gas diffusion electrode) when the

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separator is incorporated into a fuel cell. Since the adjacent member is also formed of a carbon material, the contact resistance between the carbon material coating of the separator and the adjacent member can be reduced. Thus, the provision of the first coating layer of an electrically conductive material and the second coating layer secures a sufficiently high corrosion resistance and a sufficiently high electric conductivity. See col. 2, lines 15-34. The first coating layer may be a metal layer, such as tin, formed by shot peening. The tin coating layer does not have any cracks or pores (col. 11, lines 39-62; col. 12, lines 12-19). The separators have ribs that define fluid flow passages (col. 4, lines 9-23). Yoshimura teaches that a base metal separator material can be coated with tin (a base metal) and a thermal expansion graphite (carbon material) in order to secure a high corrosion resistance and reduce the production cost in comparison with a case where use of a noble metal (base metal), such as platinum rhodium or the like is used (col. 7, lines 32-55). The first coating layer is formed after a passive state coating is removed from the base member (predetermined treatment). See abstract.

Yoshimura teaches in the regions of the separators defining the gas passages (non-contact surface), the coating layer of the electrically conductive material and/or the coating layer of the carbon material may be omitted in those regions (col. 15, lines 50-65). Furthermore, since there is no need to secure an electric conductivity in the regions other than the contact faces, it becomes unnecessary to remove the passive state film from those regions of the base material of the separator (col. 16, lines 20-35). The first coating layer may include graphite material (electrically conductive particles). If the graphite material is taken up into the first coating layer, the contact resistance between the first coating layer and the second coating layer may be decreased (col. 11, lines 3-9).

Yoshimura teaches the first coating layer comprising a metal having a low melting point (of about 500°C or lower). Example of the metals for the first coating layer include tin, indium, lead, bismuth and the like. Furthermore alloys such as Sn-Pb, Sn-Be or Sn-In may be used (col. 11, lines 53-62). Note the base may be stainless steel (abstract). Both indium and lead have a lower melting point than tin. Tin, forming the first coating layer, retains a sufficiently high electric conductivity if oxidized (col. 8, lines 10-12).

Thus the claims are anticipated.

The claims are alternatively unpatentable. Yoshimura does not explicitly state the metal coating layer is successively subjected to melting and gradual cooling. However, the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. In re Fessman. Thus, whether a molten coating method, a physical vapor deposition method, a spray coating method or a shot peening method is used to form the coating, the products as an end result are substantially the same. Furthermore, Yoshimura does not explicitly state the metal coating layer is formed from crystal grains having an average grain size of 0.1 mm or more. However, the courts have ruled that product-by-process limitations, in the absence of unexpected results, are obvious. In re Fessman. Thus, regardless of the size of the metal grains used to form the metal coating layer, only properties of the end product (for example, the size of the metal coating layer of the fuel cell separator) are given patentable weight.

### ***Response to Arguments***

Applicant's arguments filed 7/15/03 have been fully considered but they are not persuasive.

All 35 U.S.C. 112, 2<sup>nd</sup> paragraph, rejections have been withdrawn.

Applicant argues the prior art does not teach the limitation “a non-porous crystalline structure” of amended claims 1 and 13. Note this limitation is considered new matter. Applicant states the low-melting point metal is subjected to the melting process in order to reduce the number of micro-plating defects in the metal coating layer. Reducing the number of pores in the metal coating layer is not the same as a non-porous crystalline metal coating layer.

Applicant asserts the various methods of forming the metal coating layer disclosed by Yoshimura do not result in the same non-porous crystalline structure that is achieved by the generalized melting and flow of material to eliminate defects (pores) as in the claimed invention. However, Applicant merely asserts that the methods of Yoshimura do not result in a non-porous structure without providing any evidence to support the assertion. Furthermore, Yoshimura teaches a shot peening method that results in a plating layer without a pore. The first coating metal (such as tin) is formed on the substrate surface by shot peening so that the metal spreads (flows) to form a metal plating layer on the substrate surface (col. 11, lines 41-52; col. 12, lines 12-19).

Applicant similarly argues Hwang does not teach or suggest the creation of a separator with the claimed invention’s non-porous crystalline structure. Note this limitation is considered new matter and if the limitation is withdrawn the rejection of claims 1, 2, 4, 13, 14, 16, 25 and 26 will be reinstated.

Applicant similarly argues Mukohyama does not teach or suggest the creation of a separator with the claimed invention’s non-porous crystalline structure. Note this limitation is considered new matter and if the limitation is withdrawn the rejection of claims 1, 2, 4, 13, 14, 16, 25 and 26 will be reinstated.

*Allowable Subject Matter*

Claims 2, 14 and 43-46 contain allowable subject matter. Note the claims contain new matter, the new matter rejection would have to be overcome in order for claims 2, 14 and 43-46 to be in condition for allowance.

The following is a statement of reasons for the indication of allowable subject matter: the claims are directed toward a fuel cell separator having a base metal material. The base material has a metal coating layer having a non-porous crystalline structure coated thereon. The separator further includes an underlying coating layer formed between the metal coating layer and the base material.

The prior art does not teach a fuel cell separator having a base material with a metal coating layer formed thereon wherein the separator further includes an underlying coating layer formed between the metal coating layer and the base material.

Yoshimura teaches a fuel cell separator having a base material with a metal coating layer formed thereon. However, Yoshimura does not teach the fuel cell separator further includes an underlying metal coating layer formed between the metal coating layer and the base material.

*Conclusion*

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after



the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is (703) 308-8821. The Examiner may normally be reached Monday-Thursday (9:00 AM-7:30 PM). My supervisor is Pat Ryan, who can be reached at (703) 308-2383. The Art Unit receptionist can be reached at (703) 308-0661 and the official fax numbers are 703-872-9310 (after non-final) and 703-872-9311 (after final).

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